

OPERATING SUMMARY

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HUNTSVILLE

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MINISTRY OF THE
ENVIRONMENT

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1972

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Ontario

Ministry of the
Environment

135 St. Clair Avenue West
Toronto 195, Ontario

We are pleased to present you with the 1972 operating summary for the water pollution control plant serving your community.

This summary contains data on the performance of the plant as well as relevant financial information. Of particular interest is the review of the year's activities in which significant items of these data are discussed in some detail by the operations engineer and his staff who, by their day-to-day involvement with the operation, are thoroughly familiar with the plant.

We appreciate your continuing interest in protecting the environment through the efficient operation of this wastewater treatment facility.

D.S. Caverly,
Assistant Deputy Minister.

D.A. McTavish, P. Eng.,
Director,
Project Operations Branch.

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OPERATIONS ENGINEER
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135 St. Clair Avenue West
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HUNTSVILLE
WATER POLLUTION CONTROL PLANT

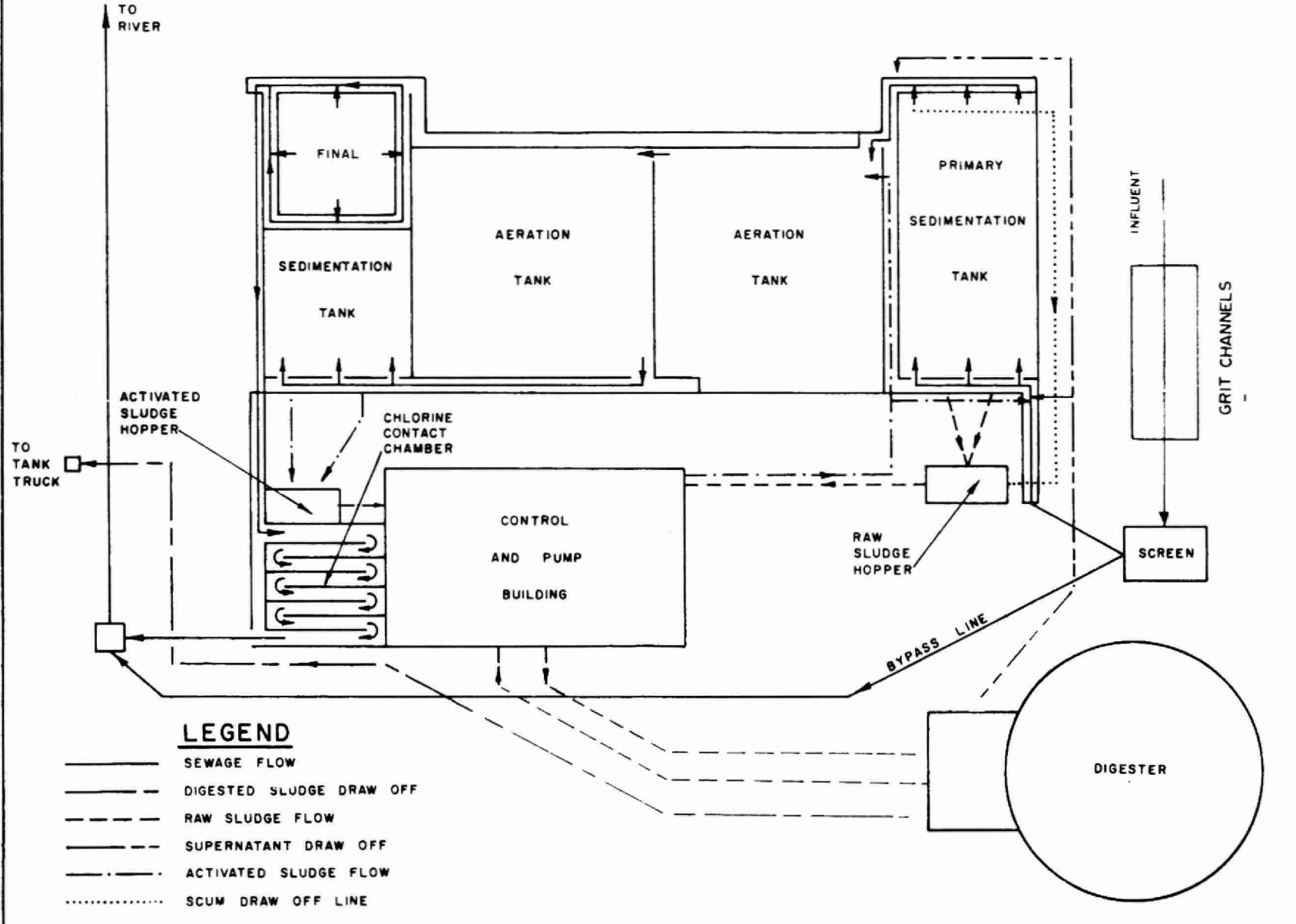
operated for
THE TOWN OF HUNTSVILLE
by the
MINISTRY OF THE ENVIRONMENT

1972 ANNUAL OPERATING SUMMARY

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HUNTSVILLE WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO.	2-0015-58	<u>PRIMARY TREATMENT</u>	<u>CHLORINATION</u>
TREATMENT	Activated Sludge	<u>Grit Removal</u>	Type: W & T Size: One 20 lb/day
DESIGN FLOW	0.25 mgd	Type: Manually cleaned channels Size: Two 10' x 1'7" x 3'4" (2 x 52½ cu ft) Velocity: 0.99 fps	<u>Chlorine Contact Chamber</u> Size: One 12' x 11½' x 10' swd (6,250 gal) Retention: 36 min
DESIGN POPULATION	3,000	<u>Screening</u>	
BOD - Raw Sewage - Removal	250 mg/l 90-95%	Type: Manually cleaned bar screen	<u>OUTFALL</u> - 105' of 15" corrugated pipe to Muskoka River
SS - Raw Sewage - Removal	250 mg/l 90-95%	<u>Primary Sedimentation</u> Type: United Steel Corp. Size: One 30' x 10' x 8' (15,000 gal) Retention: 1.5 hr Loading: Surface, 833 gal/ft²/day Weir, 25,000 gal/ft/day	<u>SLUDGE HANDLING</u> <u>Digestion System</u> - Single-stage Type: Mixed by recirculation, Fairbanks- Morse, 100 gpm @ 40' tdh Size: One 30' dia x 20' swd (15,000 cu ft or 93,500 gal) Loading: 1.2 lb/cu ft/mo
		<u>SECONDARY TREATMENT</u> <u>Aeration Tanks</u> Type: Mechanical aeration Size: Two 24' x 24' x 12' (87,500 gal) Retention: 8.4 hr <u>Aerators:</u> Chicago Pump (2) <u>Secondary Sedimentation</u> Type: United Steel Corp. Size: One 30' x 13' x 12' (29,300 gal) Retention: 2.8 hr Loading: Surface, 640 gal/ft²/day 1 Weir, 5,300 gal/ft/day	<u>PUMPING STATIONS</u> <u>Pumping Station #1</u> Type: Chicago Pump Size: Two 290 gpm <u>Pumping Station #2</u> Type: Chicago Pump Size: Two 80 gpm <u>Pumping Station #3</u> Type: Chicago Pump Size: One 80 gpm

'72 Review

GENERAL

The project consists of an 0.25 million gallons per day secondary treatment plant and three pumping stations, as well as two Town-owned pumping stations. The plant's effluent is discharged into the Muskoka River after chlorination. Alum treatment for the removal of phosphorus was introduced into the plant process during the year.

The plant is operated by a chief operator, assisted full time by a town employee whose salary is not included in the operating costs.

PLANT FLOWS AND CHLORINATION

The total recorded flow to the plant in 1972 was 130 million gallons. Flows in excess of 0.55 million gallons were given primary treatment and chlorination only. The average daily flow was 0.36 million gallons and the maximum recorded daily flow was 0.53 million gallons. The maximum flow rate to the plant cannot be measured since the flow recorder is located after the secondary clarifiers. The total recorded flow was approximately 5 million gallons less than the 1971 recorded flow while the average daily flows for both 1971 and 1972 remained approximately the same. There was a large amount of surface water being treated throughout the year.

A total of 4145 pounds of chlorine was used during the year. An average dosage of 3.2 mg/l was applied to maintain an 0.5 mg/l residual in the plant effluent. Flows receiving primary treatment only were heavily chlorinated in a manhole after the chlorine contact chamber and prior to the river outlet.

The average daily flows exceeded the plant's hydraulic capacity approximately 97 percent of the time during the year.

PLANT EFFICIENCY

The influent BOD and suspended solids averaged 133 mg/l and 121 mg/l respectively in 1972. The effluent BOD and suspended solids averaged 12 mg/l and 29 mg/l respectively during the same period. The average reduction in BOD and suspended solids was 91 and 76 percent respectively. This pertains only to sewage which receives secondary treatment. That which is bypassed after primary treatment receives a much lower degree of treatment. Compared to the 1971 BOD reduction of 93 percent and suspended solids reduction of 86 percent, the BOD reduction remained constant while the suspended solids reduction decreased 10 percent. As indicated on the graphs, the effluent BOD exceeded the Ministry's criteria of 15 mg/l approximately 26 percent of the time while the effluent suspended solids exceeded the same criteria approximately 70 percent of the time.

Phosphorus removal facilities were installed at the plant during late Spring. The facilities consist of a 5,000 gallon fiberglass storage tank with heating cables, positioned on a concrete pad, a 500 gallon fiberglass tank for daily use located in a new building which also houses two chemical feed pumps to supply the alum to either the primary influent or the aeration effluent of the plant.

During the last six months a total phosphorus reduction of 81 percent was achieved on plant flows. From the tables it can be seen that greater phosphorus removal was being achieved near the end of the year. It is expected that phosphorus removal in excess of 80 percent will be possible throughout 1973.

SLUDGE DISPOSAL

A total of 486,000 gallons of raw sludge containing 4 percent total solids was pumped to the digester in 1972. During the same period, 443,500 gallons of digested sludge containing 3.5 percent total solids were hauled by a contractor for disposal on land.

In 1972, a total of 669 cubic feet of grit was removed from the plant grit channels. This represents 4.9 cubic feet of grit per million gallons of sewage received at the plant.

CONCLUSIONS AND RECOMMENDATIONS

As in previous years, the plant operated above its hydraulic design capacity throughout the year. Although the strength of the sewage was weak due to dilution by surface water, the suspended solids reduction was low because of the high flows.

The Town's storm water separation program should be increased and plant enlargement should be implemented immediately.

The removal of phosphorus at the plant will reduce the eutrophication in the Muskoka River.

PROJECT COSTS

NET CAPITAL COST \$452,388.75

DEDUCT - Portion financed by

Long Term Debt to MOE \$452,388.75

Debt Retirement Balance at Credit
(Sinking Fund) December 31, 1972 \$ 69,050.10

Net Operating \$ 33,456.27
Debt Retirement 15,200.00
Reserve -
Interest Charged 25,369.49

TOTAL \$ 74,025.76

RESERVE ACCOUNT

Balance @ January 1, 1972 \$ 31,692.32

Deposited by Municipality -

Interest Earned 2,078.46

\$ 33,770.78

Less Expenditures -

Balance @ December 31, 1972 \$ 33,770.78

1972 COSTS

OPERATING COSTS

● PAYROLL	31	%
● FUEL	2	%
● POWER	9	%
● CHEMICALS	12	%
● GENERAL SUPPLIES	4	%
● EQUIPMENT	24	%
● REPAIRS & MAINTENANCE	4	%
● SUNDRY	13	%
● WATER	<1	%
● TRAVEL	<1	%

TOTAL ANNUAL COST

NET OPERATING	45	%
DEBT RETIREMENT	20	%
RESERVE	NIL	%
INTEREST	34	%

YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			\$ per million gal	¢ per lb BOD
1968	96.72	13,293.28	137.44	10 cents
1969	103.90	14,146.12	136.15	10 cents
1970	123.1	19,268.31	156.50	12 cents
1971	135.2	19,261.64	142.50	12 cents
1972	130.0	33,456.27	257.40	23 cents

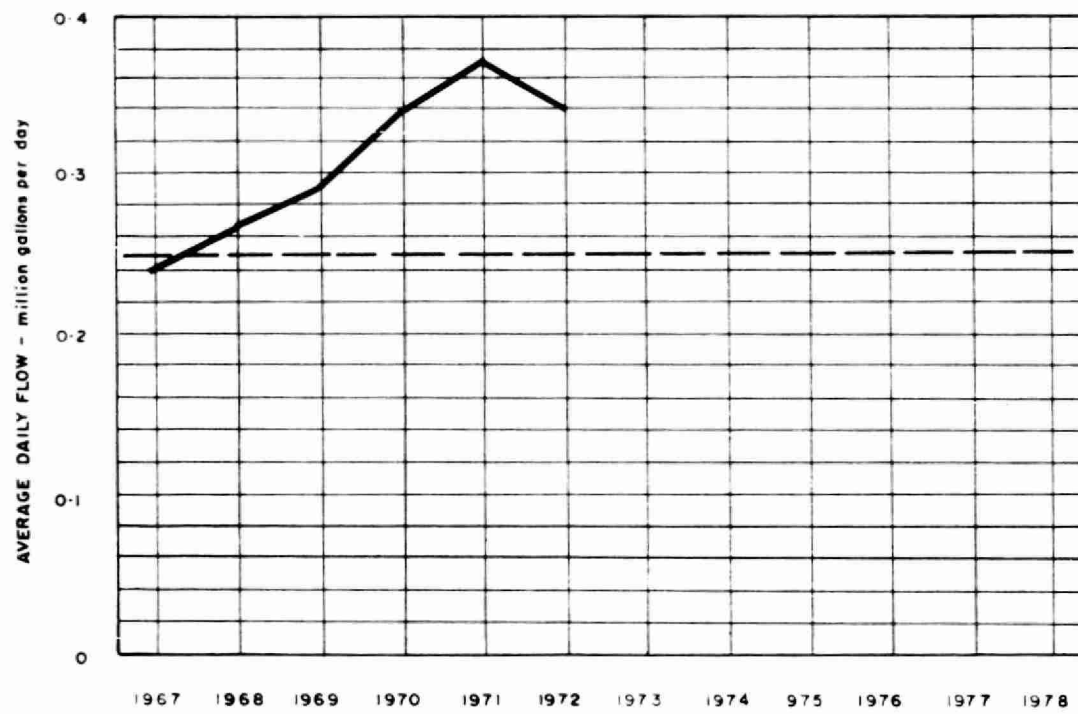
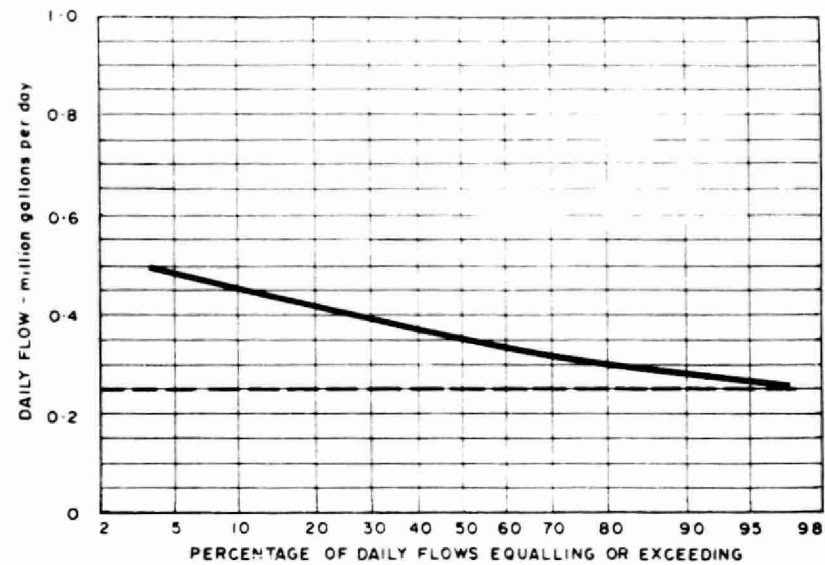
MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	1115.13	747.45		86.93			57.16	9.71	144.90	68.98		
FEB	1394.75	769.76		83.40	484.50		15.00			23.84	18.25	
MAR	1818.33	754.71		84.75	51.80		79.75		94.89	752.43		
APR	2122.26	740.43		83.85	491.80	170.55	120.15		183.38	309.70	22.40	
MAY	1138.28	873.55		72.84	56.15					135.74		
JUNE	2053.03	1070.93		53.04	422.20		181.39		267.02	19.90	38.55	
JULY	746.53	19.06		49.17	40.20		50.16	54.05	80.32	453.57		
AUG	1591.98	794.77		43.30	417.85	126.00	178.79		1.13	(2.06)	32.20	
SEPT	2892.99	732.97		44.80	24.40		113.67	1085.30	117.31	774.54		
OCT	7393.77	866.96			429.70		9.63	5443.15	188.56	406.97	48.80	
NOV	1846.87	38.80		102.22	27.50	809.68	114.77			753.90		
DEC	9342.35	2943.23		67.30	525.40	2835.88	449.50	1314.43	404.35	632.81	92.60	76.55
TOTAL	33456.27	10352.62		771.60	2971.50	3942.11	1369.97	7906.64	1481.86	4330.32	252.80	76.55

Brackets indicate credit.

* Sundry includes sludge haulage costs of \$3,374.40

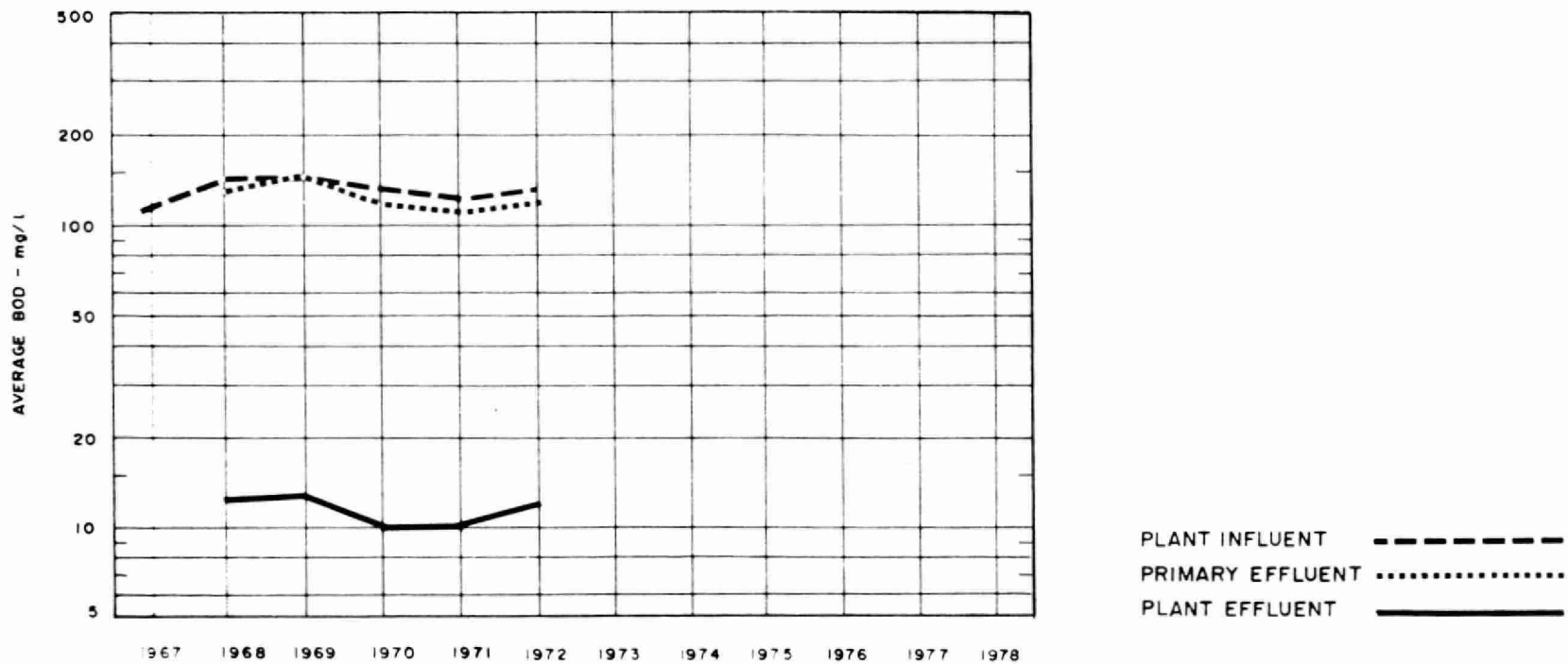
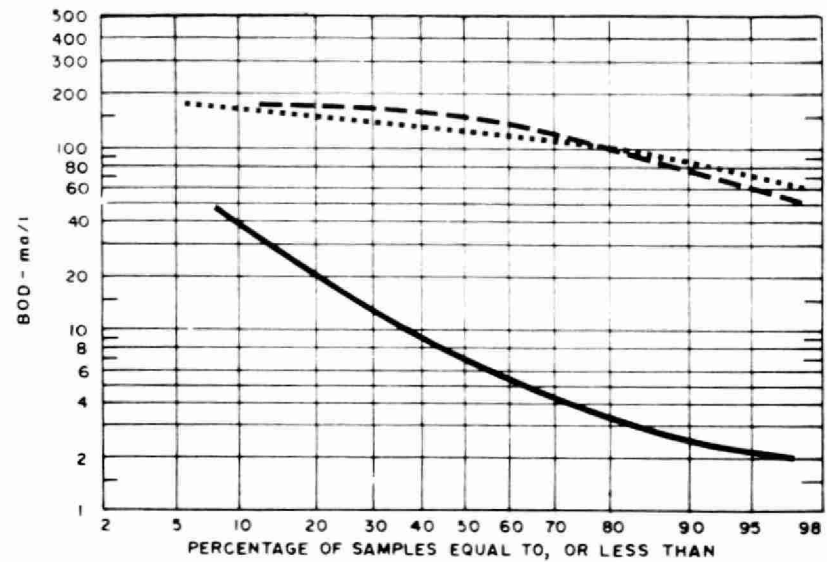
PROCESS DATA FLOWS



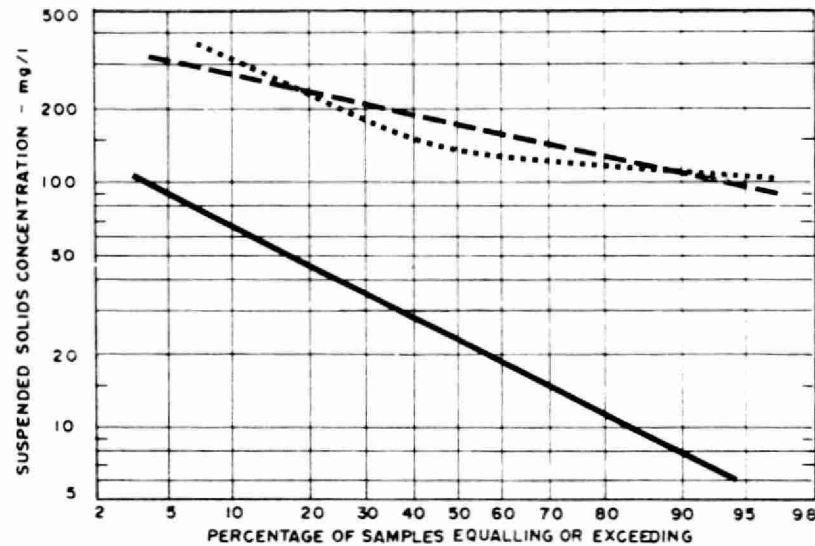
PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l P	mg/l P
JAN	9.4	.30	.37	155	25	84	12.2	115	35	70	7.5	10.1	4.0
FEB	8.3	.29	.32	130	14	89	9.6	55	25	54	2.5	9.2	4.1
MAR	10.5	.34	.52	135	15	89	12.6	205	33	84	18.0	8.8	3.4
APR	14.3	.47	.56										
MAY	12.0	.39	.49	150	26	83	9.4	110	30	73	9.6	9.6	2.2
JUNE	9.3	.31	.38	105	4	96	8.8	100	5	95	8.8	6.8	2.7
JULY	11.4	.37	.49	115	8	93	12.2	120	15	88	12.0	7.0	2.5
AUG	12.4	.40	.53	130	6	95	15.4	130	30	77	12.4	7.5	1.1
SEPT	10.7	.36	.45	165	19	88	15.6	115	95	17	2.1	6.1	2.8
OCT	9.9	.32	.52	135	3	98	13.0	98	15	85	8.2	8.7	0.3
NOV	11.1	.37	.54	115	5	96	12.2	160	8	95	16.8	7.0	0.4
DEC	10.7	.34	.45										
TOTAL	130.0	-	-	-	-	-	-	-	-	-	-	-	-
AVG.	-	.36	MAXIMUM .53	133	12	91	12.1	121	29	76	9.8	8.2	2.4
No. of Samples	-	-	-	18	18	-	-	18	18	-	-	17	18

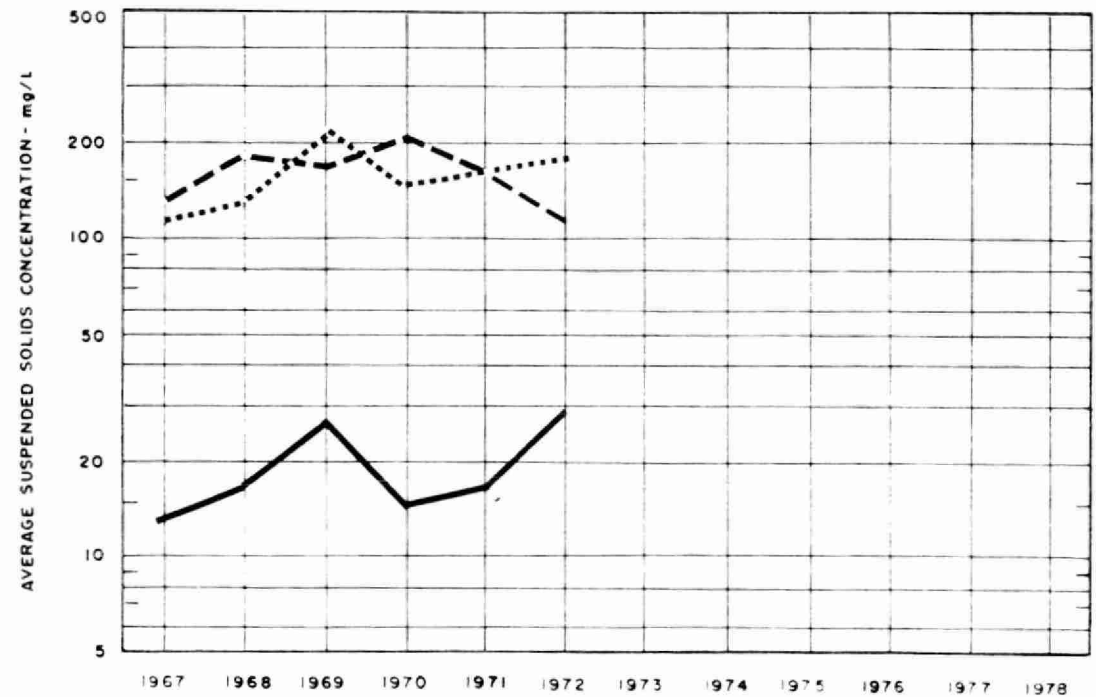
BIOCHEMICAL OXYGEN DEMAND



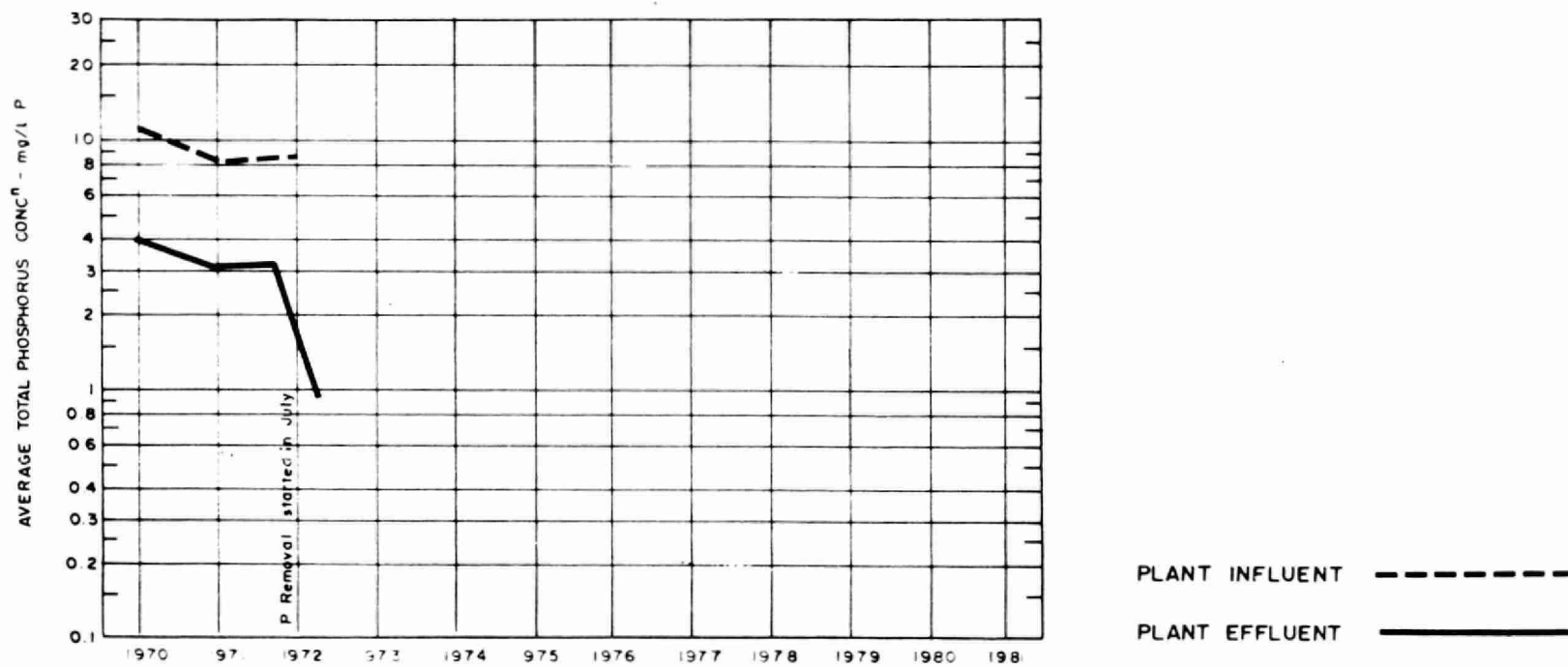
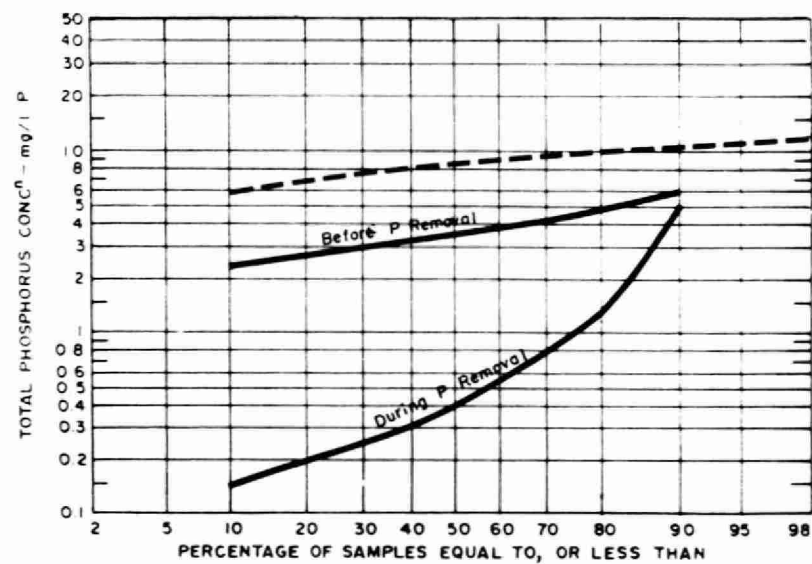
SUSPENDED SOLIDS



PLANT INFLUENT - - - - -
 PRIMARY EFFLUENT
 PLANT EFFLUENT _____

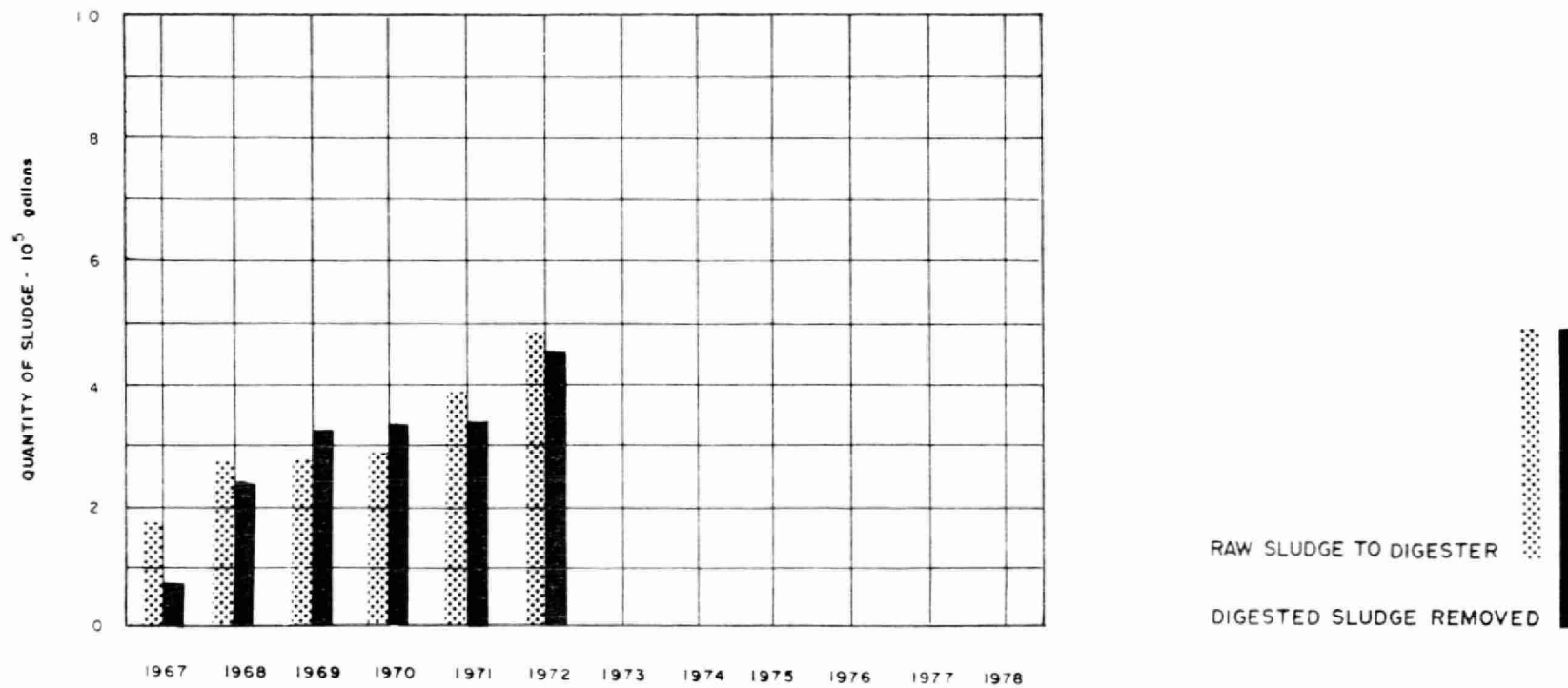
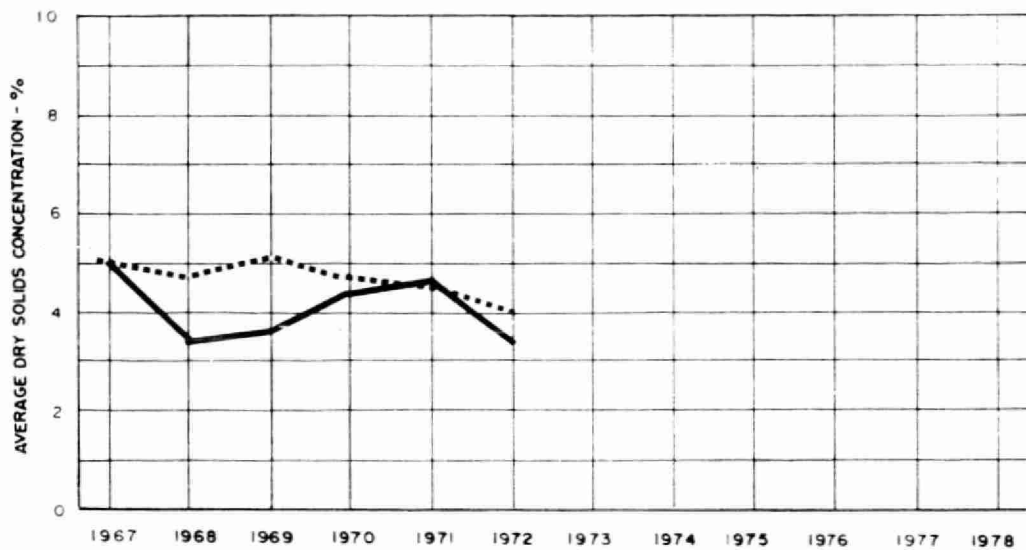


PHOSPHORUS



DIGESTION

RAW SLUDGE
DIGESTED SLUDGE ———



TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CL ₂ USED pounds	AVG DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day ⁻¹	AIR 1000 ft ³ lb BOD	RAW SLUDGE			DIGESTED SLUDGE			SUPER- NATANT T. S. %	AMOUNT HAULED cubic yards
									QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOL. SOLIDS %		
JAN	3	294	3.1	165	130	800	.7		46	3.4	73	37	1.8	53		222
FEB	12	265	3.2	145	215	700	.7		39	2.1	70	42	2.9	50	.1	252
MAR	34	402	3.8	110	225	1500	.3		39	5.6	54	35	2.6	49		210
APR	103	526	3.7						15			22				129
MAY	116	463	3.8	130	100	700	.8		25	1.7	65	18	6.5	33	.1	105
JUNE	90	264	2.8	100	100	1100	.3		52	4.3	52	35	5.4	27	.1	210
JULY	135	331	2.9	95	105	900	.4		43	5.4	46	44	4.5	36	.1	263
AUG	72	400	3.2	110	170	1400	.4		36	5.1	54	45	1.8	54		270
SEPT	18	310	2.9	90	165	1700	.2		41	4.6	55	44	2.9	53	.3	263
OCT	41	314	3.2	102	157	1500	.3		47	3.8	60	53	2.9	49	.2	315
NOV	28	310	2.8	125	310	1500	.4		47	3.9	38	29	4.1	49	.1	173
DEC	17	266	2.5						56			58				347
TOTAL	669	4145	-	-	-	-	-	-	486	-	-	462	-	-	-	2759
AVG.	4.9 cu. ft/mil gal	345	3.2	117	168	1200	.4		41	4.0	57	38	3.5	45	.1	230

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